

# Conceptualizing A Place Assessment Model: A Study of the Presence and Quality of Place-making Patterns in Sacred and Secular Buildings

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## Abstract

Using qualitative and quantitative data, differences in the presence and quality of expression of place-making patterns between a sacred building (i.e., Rothko Chapel, Houston, Texas) and a secular building (i.e., Contemporary Arts Museum, Houston, Texas) were explored. A total of 48 questionnaires were administered to 24 Houston architects (i.e., 24 questionnaires at each setting). Relative frequencies were calculated for multiple-choice answers in the questionnaire, while open ended questionnaire items were subjected to inductive content analysis. The analyzed data was synthesized to test whether the presence and quality of expression of place-making patterns at the selected buildings, contributed towards the sacredness of place. Through the research, a place assessment model (based on the presence and quality of expression of specific place-making patterns) was conceptualized and tested – a model that can be used by researchers and architects to access the spatial and physical characteristics of built environments. In addition, a place-making pattern matrix meant to serve as a guide to architects in creating everyday architecture that is extraordinary, was developed as part of this study. The research intends to increase our understanding of whether, and how certain place-making patterns contribute to place being experienced as sacred. In this sense, knowledge gained through the study, contributes

significantly toward the development of the theory of place-making. The study concludes that built environments which possess a higher presence and higher quality of expression of certain place-making patterns are more likely to be experienced as sacred, than built environments with a lower presence and lower quality of expression of the place-making patterns.

## Introduction

Defining the sacred is improper, because definitions imply limits and are not all-inclusive.<sup>1</sup> But, though the sacred cannot be defined, it can be sensed and partially understood – its presence can be known.<sup>2</sup> According to the famed historian of religion, Mircea Eliade, the sacred can be thought of as the “opposite of the profane” – something that reveals and manifests itself to us as a wholly different order from the profane, thus making us aware of its reality.<sup>3</sup> To understand the sacred in architecture, therefore, one has to explore multiple ways in which it finds inclusion in place-making (i.e., the action for creating a place or sense of place).

According to Eliade, desecralization of place has made it increasingly difficult for modern societies to rediscover existential dimensions of the sacred that were once readily accessible to humans of archaic societies in their everyday places.<sup>4</sup> In a time dominated by vapid architectural styles and economy-oriented place-making strategies, the rediscovery of timeless design principles and values, which have guided and informed place-making from time immemorial, is often overlooked or worse, forgotten. The motivation behind this study, therefore, comes from the need to reconnect with such design principles and to reinvigorate the corporeal process of desecralised architecture. In this sense, the study is intended to foster a renewed interest in the meaning and use of place-making characteristics that contribute towards the sacredness of place, and further, to provide empirical data that contributes toward the development of the theory of place-making. *Patterns* refer to recurring or underlying characteristics which *first*, can be discerned and *second*, can be used to generate something. Place-making patterns, within

the context of this study, can be defined as spatial and/or physical characteristics that contribute to creating a sense of place. Critchlow propounds that such characteristics that contribute towards the sacredness of place, express higher intensions, exemplifications, and important cultural values.<sup>5</sup> Place-making patterns, when uplifted in place, therefore, could transform secular architecture into sacred environments. How does this process happen? What are the contributing factors? Can they be objectified? One assertion is that sacred places embody specific place-making patterns, by means of which they distinguish themselves from our other inventory of places, and reveal themselves as sacred to us.<sup>6</sup> However, place-making patterns, theorized to be exclusive to sacred places, may also be present at secular places.<sup>7</sup> The purpose of this research was, therefore, to examine differences in the presence and quality of expression of place-making patterns between a sacred and secular building.

The research was guided by the following questions: 1) Do place-making patterns, common to both sacred and secular places, differ in their presence and quality of expression?; and 2) If yes, then how? The central hypothesis for this study is that *built environments which possess a higher presence and higher quality of expression of certain place-making patterns are more likely to be experienced as sacred, than built environments with a lower presence and lower quality of expression of the place-making patterns*. The hypothesis was tested through the following research objectives: 1) Assessing the difference in the presence of place-making patterns between a sacred and secular building; 2) Assessing the difference in the quality of expression of place-making patterns between a sacred and secular building; and 3) Validating whether the selected buildings were experienced to be sacred or secular.

## Background

Several authors have studied and developed characteristics associated with place-making in their respective works. These include (in ascending order of date of publication): a) Marcus Vitruvius Pollio (*The Ten Books on Architecture*);<sup>8</sup> b) Andrea Palladio (*The*

*Four Books on Architecture*);<sup>9</sup> c) Christopher Alexander, Sara Ishikawa and Murray Silverstein (*A Pattern Language: Towns, Buildings, Construction*);<sup>10</sup> d) Michael Brill (*Using the Place-Creation Myth to Develop Design Guidelines for Sacred Space*);<sup>11</sup> e) Charles Moore and Donlyn Lyndon (*Chambers of a Memory Palace*);<sup>12</sup> f) Phillip Tabb (*Sacred Place: The Presence of Archetypal Patterns in Place Creation*);<sup>13</sup> and g) Christopher Alexander (*The Nature of Order: The Phenomenon of Life*).<sup>14</sup> Of the aforementioned authors, Brill and Tabb theorize the presence of specific design characteristics or place-making patterns at sacred places. The place-making patterns ascribed by Brill and Tabb, seem to have been derived from the philosophical underpinnings of the work of famed historian of religion, Mircea Eliade – *The Sacred and the Profane: The Nature of Religion*.

In his text, Eliade suggests that sacred places symbolize a break in the homogeneity of space, and as such, are qualitatively different from our other inventory of places.<sup>15</sup> Brill suggests that this qualitative difference is experienced at sacred places through the presence of fourteen distinct design characteristics.<sup>16</sup> Similarly, Tabb theorizes the presence of fifteen unique place-making patterns that recur at sacred places.<sup>17</sup> The place-making patterns and design characteristics proposed by Brill and Tabb are listed in Table 1. The place-making patterns proposed by both authors were analyzed for comparative similarities and differences (i.e., place-making patterns common to both authors were listed together, while unique patterns were identified separately). From this analysis, a *Comprehensive Place-making Pattern Set* (henceforth CPPS) comprising of 18 place-making patterns was developed, as shown in Table 1. The place-making patterns from the CPPS were used as a basis for conducting the research. A descriptive summary of individual place-making patterns from the CPPS is provided in Table 2.

*Table 1: Development of Comprehensive Place-making Pattern Set.*

Place-making patterns proposed by Phillip Tabb	Design characteristics proposed by Michael Brill	Comprehensive Place-making Pattern Set
Center	Making a Location and Center	Center
Bounding	Bounding	Bounding
Direction	Making Orientation and Direction	Direction
Descent	Triumph over the Underworld	Descent
Ascent	Reaching Upwards	Ascent
Passage	Passage	Passage
Numeric Order		Numeric Order
Geometric Order		Geometric Order
Spatial Order	Spatial Order	Spatial Order
Anthropomorphic Order		Anthropomorphic Order
Ordered Nature	Nature in Our Places	Ordered Nature
Celestial Order	Celestial Order	Celestial Order
	Differentiating Boundaries	Differentiating Boundaries
	Ordered Views	Ordered Views
Materiality	Materials for Making	Materiality
Elementals		Elementals
	Light	Light
Ceremonial Order	Finishing a Place	Ceremonial Order

*Table 2: Descriptive summary of individual place-making patterns from the CPPS.*

Comprehensive Place-making Pattern Set	Descriptive summary of individual place-making patterns
Center	Focal point or geometrical center of the place. It is typically associated with intense activity and meaning. It could be the focal point of ceremonial experience at the place or the conceptual essence of the place.
Bounding	Enclosures such as the outer walls, floors, roofs of a building, or the edge of the site. These enclosures could be solid or have openings (windows, doors, etc.) at specific locations to provide views and to enable physical movement.
Direction	Building alignment on site such to provide significant orientation with cardinal directions or position of the sun.
Descent	Features that occupy the under-realm and allow visual or physical descent such as ground and lower floors, foundations, footings, and wells. These features signify a connection with the earth by gesturing downward.
Ascent	Vertical features that allow visual or physical ascent such as towers, vertically ascending roof lines, tall columns, and shafts of light from above. These features signify a connection with the sky by gesturing upward.
Passage	Doorways, foyers, entrances, or thresholds that provide points of entry to the place. These thresholds function as distinct spaces of continuity between two domains.
Numeric Order	Significant recurrence of architectural features such as the singularity or duality of forms, the number of towers, doors, windows, columns, walls, and steps.
Geometric Order	Shapes that make up the physical form of the building. It defines volume in space.
Spatial Order	Rhythm and succession of spaces that could reveal symmetry and be circular, linear, radial, triangular, orthogonal, or spiral in nature. It generates correspondence and relation between spaces.
Anthropomorphic Order	Proportions in form based on measurements of the human body.
Ordered Nature	Special plants, trees, gardens, and other natural landscape features that are bordered and controlled, i.e., continually taken care of by humans. It could address the changing of seasons at the place.
Celestial Order	Openings or markers that indicate the movement of the sun, moon, other celestial objects, or through alignment of the building to articulate solstices (i.e., to celebrate temporal changes or the changing of light). It could be manifested by domed or vaulted ceilings.
Differentiating Boundaries	Boundaries such as walls and roofs that reveal differentiation depending on their orientation with the cardinal directions.
Ordered Views	Limited or specially positioned windows or openings that prevent vision between sacred and mundane spaces – windows or openings that provide direct visual interaction between sacred and mundane spaces are avoided, while direct views between two sacred places are provided. The absence of views is also expressive of this pattern – windows or openings are sometimes avoided in a space to restrict views that would otherwise negate the experience within the place.
Materiality	Building materials such as brick, stone, wood, cement, steel, ceramic tile, plaster, and glass.
Elementals	Fire, water, air, and earth. It is expressed by features such as fireplaces, fountains, ventilation openings, and masonry walls.
Light	Luminance that could provide orientation with the cardinal directions or demarcate the passage of time with movement of the sun across the sky. The absence of luminance (i.e., darkness) also forms an essential quality of light.
Ceremonial Order	Spaces that allow for ceremony, meditation, prayer, temporal/seasonal celebrations or ritual/consecrative acts at the place.

## Methodology

A set of 10 criteria, ranging from *Place-type* to *Accessibility* were used in selecting the case studies (Table 3). The purpose of this study was to explore differences in the presence and quality of expression of place-making patterns between sacred and secular buildings. Difference in place-type, therefore, was the most important criterion in selecting the case studies, i.e., one case study had to be an acknowledged sacred place, while the other case study had to be a secular place. This fundamental difference in place-type between the two case studies allowed for the study of the difference in presence and quality of expression of place-making patterns between sacred and secular buildings. Based on the 10 criteria, the two case studies were Rothko Chapel and Contemporary Arts Museum, both located in Houston, Texas.

*Table 3: Comparative analysis of criteria associated with the selection of case studies.*

Criteria	Rothko Chapel	Contemporary Arts Museum
Place Type	Sacred place (non-profit institution)	Secular place (non-profit institution)
Spatial Program	Gallery space	Gallery space
Denomination	Non-denominational	Non-denominational
Site Context	Urban	Urban
Cultural Context	Houston, Texas	Houston, Texas
Building Life	1971	1972
Design Process	Designed by professional architects (Philip Johnson, Howard Barnstone, Eugene Aubry)	Designed by professional architect (Gunnar Birkits)
Scale	Area = 4,500 sq. ft.	Area = 8,900 sq. ft.
Visitation	Facility open year round	Facility open year round
Accessibility	100 miles from researchers' location	100 miles from researchers' location

Rothko Chapel is an acknowledged sacred building and houses a group of fourteen paintings by Mark Rothko. The paintings are exhibited along the periphery of the interior octagonal shaped plan of the Chapel. Besides exhibiting Rothko's work, the Chapel functions as a place for private meditation, common worship, and hosting colloquia related with

philosophical and religious themes. In contrast, Contemporary Arts Museum is a secular building, dedicated to exhibiting contemporary art to the public.

The questionnaire was comprised of open-ended as well as multiple choice questions. The presence of individual place-making patterns from the CPPS at the sacred and secular buildings was scored by using the terms – *Yes* and *No* (where *Yes* = pattern is present, and *No* = pattern is absent). To assess the quality of expression of the place-making patterns at the sacred and secular buildings, questionnaire responses allowed for scoring from 1 to 5, on a 5 point scale (where 1 = very low quality; 2 = low quality; 3 = intermediate quality; 4 = high quality; and 5 = very high quality). The questionnaire contained an open-ended questionnaire item – *Comments*, which allowed for recording ways in which participants observed the presence of individual place-making patterns from the CPPS at the sacred and secular buildings. The sacredness of the selected buildings was scored by using the terms – *Yes* and *No* (where *Yes* = place is sacred, and *No* = place is not sacred), followed by an open ended question – *Please explain briefly, why you feel that this place is sacred?*, allowing participants to justify why they felt the place was sacred (if at all). Upon completion of pilot studies, minor changes were made to the questionnaire. The final questionnaire included 2 introductory questions (requesting participant age and gender), 37 multiple-choice answers, and 19 open-ended questions.

Questionnaire items were specific in their usage of architectural language. Therefore, completing the questionnaire entailed participants to have an architectural background. The sample population for the questionnaire was, therefore, architects from firms in Houston, providing basic architectural services and specializing in the design of both, religious and secular facilities. The online directory on the AIA Houston website served as a useful and effective guide for identifying participants for this study. The inclusion criteria, used to derive the list of architecture firms for recruiting questionnaire participants were as follows: 1) Houston, Texas, as the geographic location of firms; 2) Basic architectural services as the type of service provided by firms; and 3) Religious facilities as the building-type specialization of firms. Architecture

firms not matching these 3 criteria were excluded. A total of 90 architecture firms matching the 3 criteria were identified and contacted. Of these, 24 firms (i.e., architects) replied with positive responses, stating their willingness to participate in the study. As a result, a total of 48 questionnaires (24 at the sacred place and 24 at the secular place) were administered in this study.

During data analysis, relative frequencies were calculated for multiple-choice answers, while open ended questionnaire items were subjected to inductive content analysis, *first*, reading responses to identify emerging categories and, *second*, coding for category inclusion. Descriptive analysis and charts were used to analyze questionnaire results.

## Results

A total of 48 questionnaires (24 at each setting) were administered to 24 architects at the sacred and secular places. Of the 24 architects, 16 participants were male, while 8 participants were female. A total of 12 participants were in the age group of 25 to 40 years, 8 participants were in the age group of 41 to 55 years, 3 participants were in the age group of 56 to 70 years, and 1 participant was in the age group of 71 years or above.

Questionnaire results are categorized as follows: 1) Assessment of presence of place-making patterns at selected buildings; 2) Assessment of quality of expression of place-making patterns at selected buildings; and 3) Assessment of sacredness of selected buildings.

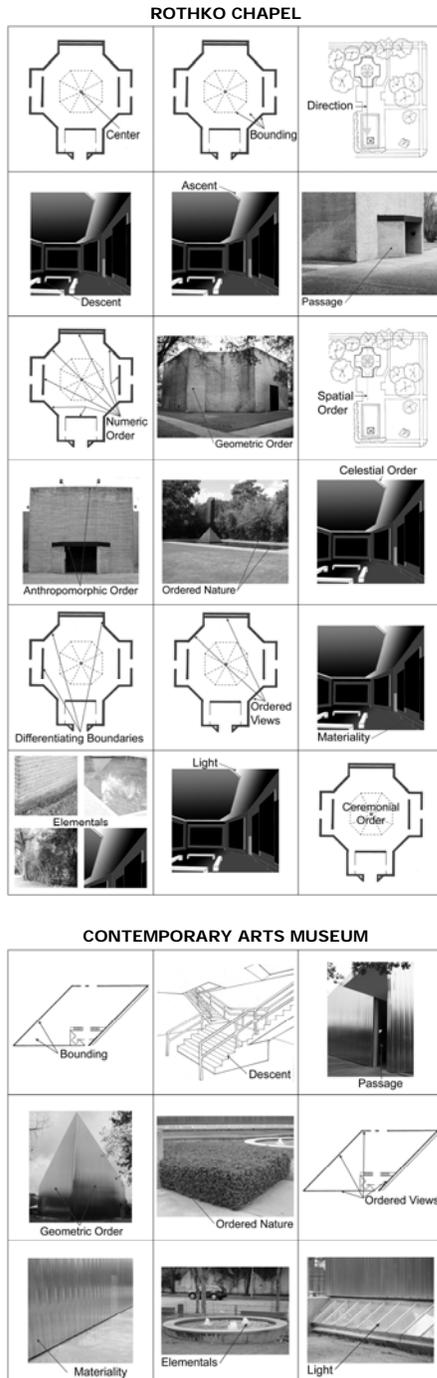
### ***Assessment of Presence of Place-making Patterns at Selected Buildings:***

A summary of ways in which questionnaire participants observed the presence of the place-making patterns at Rothko Chapel and Contemporary Arts Museum is shown in Table 4. The table is followed by graphical data showing ways in which participants experienced the presence of the place-making patterns at Rothko Chapel and Contemporary Arts Museum (Figure 1).

*Table 4: Presence of place-making patterns as observed by participants at Rothko Chapel and Contemporary Arts Museum.*

Pattern list	Rothko Chapel	Contemporary Arts Museum
Center	Spatial center of octagonal shaped plan of Chapel.	No comments recorded.
Bounding	Walls, floor, and ceiling of Chapel.	Walls, floor, and ceiling of Museum.
Direction	Alignment of Chapel entrance with pool on south.	No comments recorded.
Descent	Darkness inside Chapel.	Stairs leading to lower level of Museum.
Ascent	Light entering skylight in ceiling of Chapel.	No comments recorded.
Passage	Main entrance doorway of Chapel.	Main entrance doorway of Museum.
Numeric Order	Eight sides of Chapel.	No comments recorded.
Geometric Order	Octagonal shape of Chapel.	Parallelogram shape of Museum.
Spatial Order	Hierarchical arrangement of spaces from center of Chapel to outdoors.	No comments recorded.
Anthropomorphic Order	High ceilings of Chapel.	No comments recorded.
Ordered Nature	Water pool with bamboo screening.	Vegetative shrubs on site.
Celestial Order	Light entering skylight in ceiling.	No comments recorded.
Differentiating Boundaries	Varying offsets in wall planes of Chapel.	No comments recorded.
Ordered Views	Large solid walls of Chapel restricting all views to outside.	Walls of Museum restricting all views to outside.
Materiality	Gray walls of Chapel.	Metallic siding of Museum.
Elementals	Walls – earth, skylight – fire, pool – water, and movement of bamboo groove – wind.	Fountain – water.
Light	Sunlight entering skylight in ceiling and contrasting with darkness inside Chapel.	Sunlight entering basement clerestory windows of Museum.
Ceremonial Order	Building's inherent function as Chapel and gathering space.	No comments recorded.

Figure 1: Graphical data showing presence of place-making patterns at Rothko Chapel and Contemporary Arts Museum.



The assessment of pattern presence at each setting is as follows: 1) Percentage values ranging from 83.3% to 100% (20 to 24 participants agreeing that pattern is present) indicate that pattern presence is very high (i.e., likelihood of pattern being present is very high); 2) Percentage values ranging from 62.5% to 79.1% (15 to 19 participants agreeing that pattern is present) indicate that pattern presence is high (i.e., likelihood of pattern being present is high); 3) Percentage values ranging from 41.6% to 58.3% (10 to 14 participants agreeing that pattern is present) indicate that pattern presence is uncertain (i.e., likelihood of pattern being present or absent is uncertain); 4) Percentage values ranging from 20.8% to 37.5% (5 to 9 participants agreeing that pattern is present) indicate that pattern presence is low (i.e., likelihood of pattern being present is low); and 5) Percentage values ranging from 4.1% to 16.6% (1 to 4 participants agreeing that pattern is present) indicate that pattern presence is very low (i.e., likelihood of pattern being present is very low). The assessment of the presence of the place-making patterns for the sacred and secular buildings is shown in Table 5.

**TABLE 5: Assessment of pattern presence at selected buildings based on percentage (%) values of participants who agreed that the place-making patterns were present or absent.**

Pattern list	Rothko Chapel		Contemporary Arts Museum	
	Percentage (%) of participants who agreed that pattern is present	Pattern presence based on percentage (%) values of participants	Percentage (%) of participants who agreed that pattern is present	Pattern presence based on percentage (%) values of participants
Center	95.8%	Very high	25%	Low
Bounding	100%	Very high	83.3%	Very High
Direction	70.8%	High	33.3%	Low
Descent	66.6%	High	66.6%	High
Ascent	91.6%	Very high	58.3%	Uncertain
Passage	83.3%	Very high	58.3%	Uncertain
Numeric Order	83.3%	Very high	58.3%	Uncertain
Geometric Order	100%	Very high	87.5%	Very High
Spatial Order	87.5%	Very high	58.3%	Uncertain
Anthropomorphic Order	75%	High	41.6%	Uncertain
Ordered Nature	95.8%	Very high	75%	High
Celestial Order	87.5%	Very high	16.6%	Very low
Differentiating Boundaries	66.6%	High	33.3%	Low
Ordered Views	83.3%	Very high	66.6%	High
Materiality	100%	Very high	91.6%	Very High
Elementals	91.6%	Very high	66.6%	High
Light	100%	Very high	62.5%	High
Ceremonial Order	100%	Very high	25%	Low

At Rothko Chapel, the presence of 14 place-making patterns – *Center*, *Bounding*, *Ascent*, *Passage*, *Numeric Order*, *Geometric Order*, *Spatial Order*, *Ordered Nature*, *Celestial Order*, *Ordered Views*, *Materiality*, *Elementals*, *Light*, and *Ceremonial Order* was very high, while the presence of the remaining 4 place-making patterns – *Direction*, *Descent*, *Anthropomorphic Order*, and *Differentiating Boundaries* was high. At Contemporary Arts Museum, the presence of 3 place-making patterns – *Bounding*, *Geometric Order*, and *Materiality* was very high, while the presence of 5 place-making patterns – *Descent*, *Ordered Nature*, *Ordered Views*, *Elementals*, and *Light* was high. The presence of 4 place-making patterns – *Center*, *Direction*, *Differentiating Boundaries*, and *Ceremonial Order* was low, while the

presence of 1 place-making pattern – *Celestial Order* was very low at Contemporary Arts Museum. The presence of 5 place-making patterns – *Ascent*, *Passage*, *Numeric Order*, *Spatial Order*, and *Anthropomorphic Order* remained uncertain at Contemporary Arts Museum.

Based on the opinion of questionnaire participants, a comparison of the presence of place-making patterns between Rothko Chapel and Contemporary Arts Museum is shown in Figure 2. As observed, questionnaire results indicated that the presence of all 18 place-making patterns at Rothko Chapel was higher than the presence of their counterparts at Contemporary Arts Museum. Difference in percentage values of the presence of place-making patterns between Rothko Chapel (RC) and Contemporary Arts Museum (CAM) is shown in Table 6.

Figure 2: Pattern presence at Rothko Chapel and Contemporary Arts Museum.

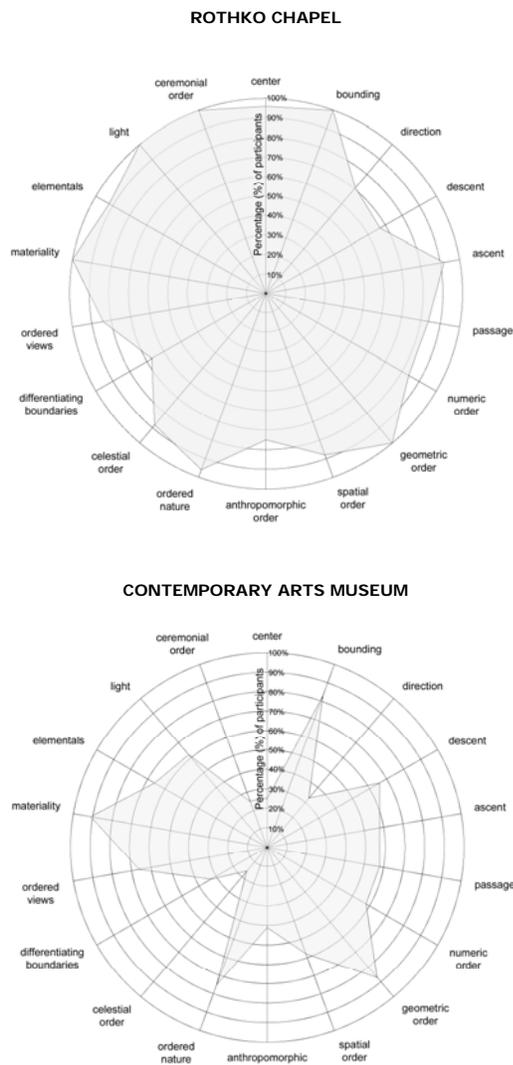
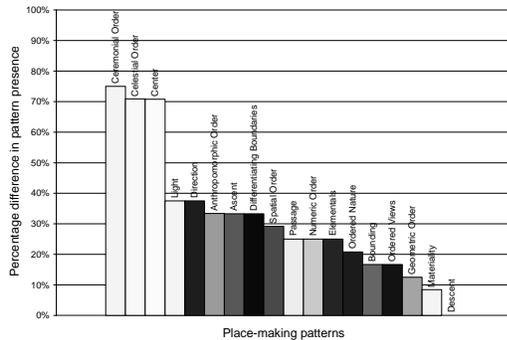


Table 6: Difference in percentage (%) values of pattern presence at selected buildings.

Pattern List	Percentage (%) values of pattern presence		Difference in percentage (%) values of pattern presence between RC and CAM
	RC	CAM	RC - CAM
Center	95.8%	25.0%	70.8%
Bounding	100.0%	83.3%	16.7%
Direction	70.8%	33.3%	37.5%
Descent	66.6%	66.6%	0%
Ascent	91.6%	58.3%	33.3%
Passage	83.3%	58.3%	25%
Numeric Order	83.3%	58.3%	25%
Geometric Order	100.0%	87.5%	12.5%
Spatial Order	87.5%	58.3%	29.2%
Anthropomorphic Order	75.0%	41.6%	33.4%
Ordered Nature	95.8%	75.0%	20.8%
Celestial Order	87.5%	16.6%	70.9%
Differentiating Boundaries	66.6%	33.3%	33.3%
Ordered Views	83.3%	66.6%	16.7%
Materiality	100.0%	91.6%	8.4%
Elementals	91.6%	66.6%	25%
Light	100.0%	62.5%	37.5%
Ceremonial Order	100.0%	25.0%	75%

Figure 3 shows the difference in percentage values of the presence of place-making patterns at Rothko Chapel over Contemporary Arts Museum. In the figure, the place-making patterns are arranged in descending order, based on difference in percentage values associated with pattern presence, as follows: 1) Ceremonial Order; 2) Celestial Order; 3) Center; 4) Light; 5) Direction; 6) Anthropomorphic Order; 7) Ascent; 8) Differentiating Boundaries; 9) Spatial Order; 10) Passage; 11) Numeric Order; 12) Elementals; 13) Ordered Nature; 14) Bounding; 15) Ordered Views; 16) Geometric Order; 17) Materiality; 18) Descent.

Figure 3: Descending order of patterns based on difference in percentage values of pattern presence.



The difference in percentage values of the presence of the place-making pattern *Ceremonial Order* was highest, while the place-making pattern *Descent* displayed no difference in percentage values of presence. Three place-making patterns – *Ceremonial Order*, *Celestial Order*, and *Center* displayed exceedingly high differences in percentage values associated with pattern presence between Rothko Chapel and Contemporary Arts Museum.

**Assessment of Quality of Expression of Place-making Patterns at Selected Buildings:**

The assessment of pattern quality at each setting is as follows: 1) Mean values ranging from 4.0 to 5.0 indicate that pattern quality is very high; 2) Mean values ranging from 3.0 to 3.9 indicate that pattern quality is high; 3) Mean values ranging from 2.0 to 2.9 indicate that pattern quality is intermediate; 4) Mean values ranging from 1.0 to 1.9 indicate that pattern quality is low; and 5) Mean values ranging from 0.1 to 0.9 indicate that pattern quality is very low. The assessment of the quality of expression of the place-making patterns at the sacred and secular buildings is shown in Table 7.

Table 7: Assessment of pattern quality at selected buildings based on mean values.

Pattern list	Rothko Chapel		Contemporary Arts Museum	
	Mean of quality of expression of pattern	Pattern quality based on mean values	Mean of quality of expression of pattern	Pattern quality based on mean values
Center	4.34	Very high	2.5	Intermediate
Bounding	4.75	Very high	3.05	High
Direction	3.76	High	3.37	High
Descent	4.0	Very high	2.68	Intermediate
Ascent	4.4	Very high	2.71	Intermediate
Passage	3.85	High	3.5	High
Numeric Order	4.4	Very high	2.92	Intermediate
Geometric Order	4.58	Very high	3.47	High
Spatial Order	4.14	Very high	2.71	Intermediate
Anthropomorphic Order	3.55	High	1.9	Low
Ordered Nature	4.08	Very high	2.05	Intermediate
Celestial Order	3.9	High	2.0	Intermediate
Differentiating Boundaries	3.31	High	2.37	Intermediate
Ordered Views	4.85	Very high	2.93	Intermediate
Materiality	4.08	Very high	3.31	High
Elementals	3.9	High	2.25	Intermediate
Light	4.54	Very high	2.26	Intermediate
Ceremonial Order	4.54	Very high	3.0	High

At Rothko Chapel, the quality of expression of 12 place-making patterns – *Center*, *Bounding*, *Descent*, *Ascent*, *Numeric Order*, *Geometric Order*, *Spatial Order*, *Ordered Nature*, *Ordered Views*, *Materiality*, *Light*, and *Ceremonial Order* was very high, while the quality of expression of 6 place-making patterns – *Direction*, *Passage*, *Anthropomorphic Order*, *Celestial Order*, *Differentiating Boundaries*, and *Elementals* was high. At Contemporary Arts Museum, the quality of expression of 6 place-making patterns – *Bounding*, *Direction*, *Passage*, *Geometric Order*, *Materiality*, and *Ceremonial Order* was high. The quality of expression of 11 place-making patterns – *Center*, *Descent*, *Ascent*, *Numeric Order*, *Spatial Order*, *Ordered Nature*, *Celestial Order*, *Differentiating Boundaries*, *Ordered Views*, *Elementals*, and *Light* was intermediate, while the quality of expression of 1 place-making pattern – *Anthropomorphic Order* was low at Contemporary Arts Museum.

Based on the opinion of questionnaire participants, a comparison of the quality of expression of place-making patterns between Rothko Chapel and Contemporary Arts Museum is shown in Figure 4. As observed, questionnaire results indicated that the quality of expression of all 18 place-making patterns at Rothko Chapel was higher than the quality of expression of their counterparts at Contemporary Arts Museum. Difference in mean values of the quality of expression of place-making patterns between Rothko Chapel (RC) and Contemporary Arts Museum (CAM) is shown in Table 8.

Figure 4: Pattern quality at Rothko Chapel Contemporary Arts Museum.

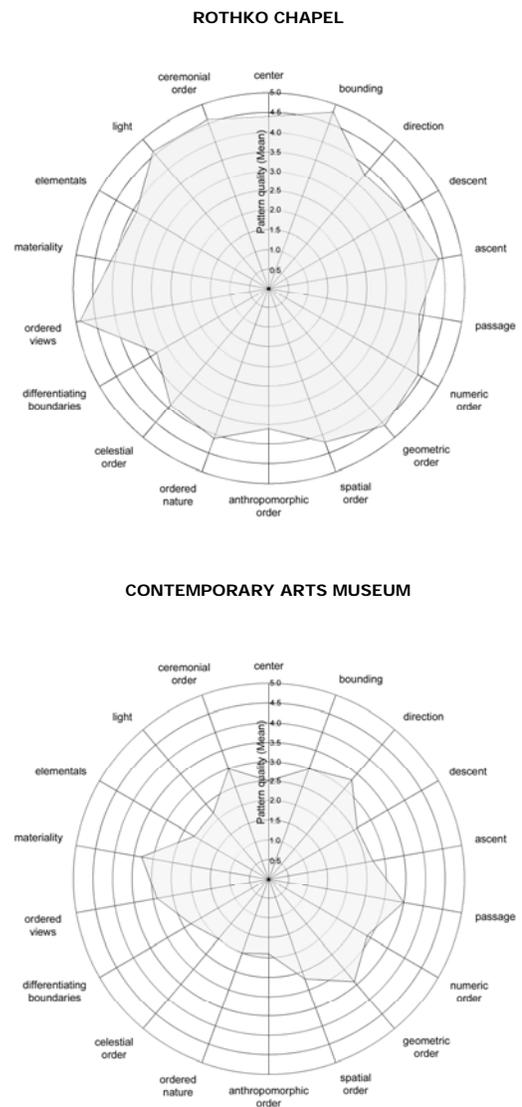
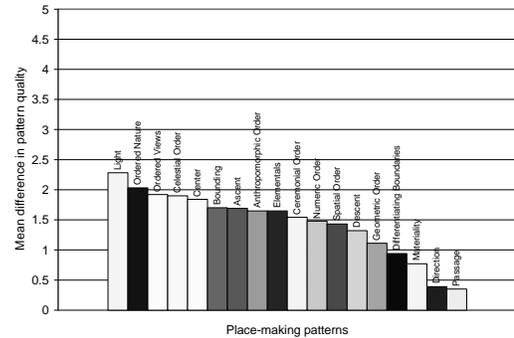


Table 8: Difference in mean values of pattern quality at selected buildings.

Pattern List	Mean values of pattern quality		Difference in mean values of pattern quality between RC and CAM
	RC	CAM	RC - CAM
Center	4.34	2.5	1.84
Bounding	4.75	3.05	1.7
Direction	3.76	3.37	0.39
Descent	4	2.68	1.32
Ascent	4.4	2.71	1.69
Passage	3.85	3.5	0.35
Numeric Order	4.4	2.92	1.48
Geometric Order	4.58	3.47	1.11
Spatial Order	4.14	2.71	1.43
Anthropomorphic Order	3.55	1.9	1.65
Ordered Nature	4.08	2.05	2.03
Celestial Order	3.9	2	1.9
Differentiating Boundaries	3.31	2.37	0.94
Ordered Views	4.85	2.93	1.92
Materiality	4.08	3.31	0.77
Elementals	3.9	2.25	1.65
Light	4.54	2.26	2.28
Ceremonial Order	4.54	3	1.54

Figure 5 shows the difference in mean values of the quality of expression of place-making patterns at Rothko Chapel over Contemporary Arts Museum. In the figure, the place-making patterns are arranged in descending order, based on difference in mean values associated with pattern quality, as follows: 1) Light; 2) Ordered Nature; 3) Ordered Views; 4) Celestial Order; 5) Center; 6) Bounding; 7) Ascent; 8) Anthropomorphic Order; 9) Elementals; 10) Ceremonial Order; 11) Numeric Order; 12) Spatial Order; 13) Descent; 14) Geometric Order; 15) Differentiating Boundaries; 16) Materiality; 17) Direction; 18) Passage. The difference in mean values of the quality of expression of the place-making pattern *Light* was highest, while the difference in the quality of expression of the place-making pattern *Passage* was lowest.

Figure 5: Descending order of patterns based on difference in mean values of pattern quality.



**Assessment of Sacredness of Selected Buildings:**

Rothko Chapel was experienced to be sacred by 95.8% of the participants, while only 8.3% of the participants felt that Contemporary Arts Museum was sacred. A summary of characteristics (as recorded by participants in the questionnaire) that contributed to sacredness experienced at Rothko Chapel and Contemporary Arts Museum is shown in Table 9.

Table 9: Summary of characteristics that contribute to sacredness of place.

Place	Characteristics that contribute to sacredness of place according to participants
Rothko Chapel	Separation of inner space from outside world; quietness of space; formal elements of building; symmetry of form; humanized proportions of building; materials; paintings; quality of light; progression of spaces – garden to inner meditative space; chapel activities.
Contemporary Arts Museum	Nature of exhibits.

**Development of Place-making Pattern Matrix:**

Based on data collected and analyzed in the research, a *Place-making Pattern Matrix*, meant to serve as a guide to architects for creating sacred place, was developed as part of this study. The hierarchical placement or ordering of place-making patterns within the Matrix is based (collectively) on differences in the

presence and quality of expression of the place-making patterns between the sacred and secular buildings. A scoring system of values from 1 to 18 (since the CPPS was composed of a total of 18 place-making patterns) was used to determine the hierarchical ordering of place-making patterns within the Matrix – the highest score of 18 was assigned to patterns with the highest difference in presence value (see Table 6) and the highest difference in quality of expression value (see Table 8), while the lowest score of 1 was assigned to patterns with the lowest difference in presence value (see Table 6) and the lowest difference in quality of expression value (see Table 8). Each of the 18 place-making patterns was, thus, assigned two scores ranging from 1 to 18 – one score for its presence and one score for its quality of expression, based on its order of listing in Tables 6 and 8. The two scores (i.e., presence score and quality of expression score) were then added to determine a total score for each place-making pattern as shown in Table 10. The total score determined the hierarchical order of each of the 18 place-making patterns within the Matrix (Figure 6).

*Table 10: Presence scores, quality of expression scores, and total scores for place-making patterns.*

Patterns	Presence score	Quality of expression score	Total score	Hierarchical order in Place-making Pattern Matrix
Light	15	18	33	1
Celestial Order	17	15	32	2
Center	16	14	30	3
Ceremonial Order	18	9	27	4
Ascent	12	12	24	5
Anthropomorphic Order	13	11	24	6
Ordered Nature	6	17	23	7
Ordered Views	4	16	20	8
Bounding	5	13	18	9
Spatial Order	10	7	17	10
Elementals	7	10	17	11
Direction	14	2	16	12
Numeric Order	8	8	16	13
Differentiating Boundaries	11	4	15	14
Passage	9	1	10	15
Geometric Order	3	5	8	16
Descent	1	6	7	17
Materiality	2	3	5	18

The Place-making Pattern Matrix is composed of 18 components, arranged in 2 concentric layers around *Sacred Place-making* at the center. *Sacred Place-making*, here, is likened to *Unity* or the *experience of wholeness* or *oneness* between the 18 place-making patterns in the outer 2 layers of the Matrix (i.e., it denotes the integral and meaningful unification of all place-making patterns that contribute to the making of sacred place. A total of 12 place-making patterns – *Ordered Nature, Ordered Views, Bounding, Spatial Order, Elementals, Direction, Numeric Order, Differentiating Boundaries, Passage, Geometric Order, Descent*, and *Materiality* are arranged in the outermost layer of the Matrix, while 6 place-making patterns – *Light, Celestial Order, Center, Ceremonial Order, Ascent*, and *Anthropomorphic Order* are arranged in the middle layer of the Matrix. The 6 place-making patterns in the middle layer of the Matrix were found to have higher differences, collectively in

pattern presence and pattern quality (between the sacred and secular buildings) than the 12 place-making patterns in the outermost layer of the Matrix.

Figure 6: Place-making Pattern Matrix.



## Conclusion

The study utilized both qualitative and quantitative data by means of questionnaires, to examine differences in the presence and quality of expression of place-making patterns between a sacred building, i.e., Rothko Chapel and a secular building, i.e., Contemporary Arts Museum. Contrast and comparison of empirical evidence which emerged from data collection and analysis, revealed that the presence and quality of expression of all 18 place-making patterns from the CPPS were higher at Rothko Chapel than their counterparts at Contemporary Arts Museum. In addition, Rothko Chapel was experienced to be sacred by the majority of participants in comparison to Contemporary Arts Museum. Data collected and analyzed, therefore, validated the hypothesis of the study by concluding that *built environments which possess a higher presence and higher quality of expression of certain place-making patterns are more likely to be experienced as sacred, than built environments with a lower presence and*

*lower quality of expression of the place-making patterns.*

The hierarchical ordering of patterns within the Place-making Pattern Matrix highlights the importance of the patterns (collectively through their presence and quality of expression) in contributing to sacredness of place. In this sense, it is likely that the presence and quality of expression of place-making patterns in the middle layer of the Matrix – *Light, Celestial Order, Center, Ceremonial Order, Ascent, and Anthropomorphic Order* have greater impact in contributing to sacredness of place, than the presence and quality of expression of the 12 place-making patterns in the outermost layer of the Matrix – *Ordered Nature, Ordered Views, Bounding, Spatial Order, Elementals, Direction, Numeric Order, Differentiating Boundaries, Passage, Geometric Order, Descent, and Materiality*. To reiterate, the presence and quality of expression of the place-making pattern *Light* is likely to have greater impact in contributing to sacredness of place, as compared to the presence and quality of expression of the place-making pattern *Materiality*.

Further studies are required to explore how, or in what specific ways the 6 place-making patterns – *Light, Celestial Order, Center, Ceremonial Order, Ascent, and Anthropomorphic Order* in the middle layer of the Matrix, impact sacredness of place, as compared to the 12 place-making patterns – *Ordered Nature, Ordered Views, Bounding, Spatial Order, Elementals, Direction, Numeric Order, Differentiating Boundaries, Passage, Geometric Order, Descent, and Materiality* in the outermost layer of the Matrix.

The contents of this study could be seen as a small step in re-evaluating the process, goals, and status of using the place-making patterns in place-design as an activity. The place-making patterns, when meaningfully embodied and uplifted in place, have the potential of contributing to the sacredness of place. The resulting architecture could, in turn, act as a medium for remembering and experiencing the sacred. It is through the lens of the place-making patterns that the qualitative nature of sacred place may be understood. In this sense, the patterns could assist in the making of place that helps us re-remember our quest for the most exemplary model of place – place that is sacred and place that heals.

## ENDNOTES

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